AMENDMENTS TO THE CLAIMS

The following is a complete and revised listing of the claims, marked with status identifiers in parentheses, underlines indicating insertions, and strikethroughs or double brackets indicating deletions. This listing is to replace all prior listing of the claims.

LISTING OF CLAIMS

1. (Currently Amended) A sensor for optical displacement measurement in accordance with a confocal imaging principle, comprising:

a first optical output adapted to emit a first illumination beam;

a second optical output adapted to emit a second illumination beam;

a beam splitter positioned so that the first illumination beam after a transmission through the beam splitter and the second illumination beam after a reflection at the beam splitter are merged;

an imaging optic, arranged and designed so that the two merged illumination beams are directed onto a surface of a measurement object, whereby, because of different displacements of the first and second optical outputs with respect to the beam splitter, a first real image of the first optical output and a second real image of the second optical output are created at different distances from the imaging optic;

a first optical input coinciding in location with the first optical output, so that a first measuring beam, created by at least a partial reflection of the first illumination beam, is created on the surface, the first illumination beam arriving in the first optical input after passing through the imaging optic and after a transmission through the beam splitter;

a second optical input coinciding in location with the second optical output, so that a second measuring beam, created by at least a partial reflection of the second illumination beam, is created on the surface, the second illumination beam arriving in the second optical input after passing

through the imaging optic and after a reflection at the beam splitter;

a first light detector adapted to record an intensity of the first measurement beam;

a second light detector adapted to record an intensity of the second measurement beam; ~~and~~

an evaluation unit, coupled to the first and second light detectors, adapted to determine, from a comparison of the intensity of the first measurement beam and the intensity of the second measurement beam, a distance between the sensor and the surface;

at least one further first optical output, positioned adjacent to the first optical output, each adapted to emit a further first illumination beam which, after a transmission through the beam splitter and after passing through the imaging optic, arrives at the surface;

at least one further second optical output, equal in number to the at least one further first optical output and positioned adjacent to the second optical output, each adapted to emit a further second illumination beam which, after a reflection at the beam splitter and after passing through the imaging optic, arrives at the surface;

at least one further first optical input, equal in number to the at least one further first optical output, each of the at least one further first optical input corresponds to one of the at least one further first optical output and coincides in location with the corresponding one of the at least one further first optical output, so that in each case a further first measuring beam is created on the surface by at least partial reflection of a further first illumination beam arriving in the further first optical input after passing through the imaging optic and after a transmission through the beam splitter;

at least one further second optical input, equal in number to the at least one further first optical output, each of the at least one further second optical input corresponds to one of the at least one further second optical output and coincides in location with the corresponding one of the at least one further second optical output, so that in each case a further second measuring beam is created

on the surface by at least a partial reflection of a further second illumination beam arriving in the further first optical input after passing through the imaging optic and after reflection at the beam splitter;

at least one further first light detector, equal in number to the at least one further first optical input, each adapted to record the intensity of a further first measurement beam; and

at least one further second light detector, equal in number to the at least one further second optical input, each adapted to record the intensity of a further second measurement beam, wherein all further light detectors are also coupled to the evaluation unit so that, from a comparison of the intensities of the further measurement beams, the distance between the sensor and at least one scanning point on the surface, equal in number to the at least one further first optical inputs, is adapted to be determined.

2. (Cancelled)

3. (Currently Amended) A sensor in accordance with claim ~~2~~ 1, wherein the optical outputs are arranged in a line.

4. (Currently Amended) A sensor in accordance with claim ~~2~~ 1, wherein the optical outputs are arranged in a matrix.

5. (Original) A sensor in accordance with claim 1, wherein the optical outputs and the optical inputs are at least approximately point-shaped.

6. (Previously Presented) A sensor in accordance with claim 1, wherein the optical

outputs and the optical inputs are each an end surface of an optical waveguide.

7. (Previously Presented) A sensor in accordance with claim 1, wherein the optical outputs and the optical inputs are each an opening of a diaphragm.

8. (Original) A sensor in accordance with claim 1, wherein the light detectors include monochrome light detectors.

9. (Previously Presented) A sensor in accordance with claim 1, wherein the first light detectors are first cameras and the second light detectors are second cameras.

10. (Currently Amended) A sensor in accordance with claim ~~2~~ 1, wherein

at least a majority of the first optical outputs are optically coupled to a first light source; and

at least a majority of the second optical outputs are optically coupled to a second light source.

11. (Cancelled)

12. (Original) A sensor in accordance with claim 3, wherein the optical outputs and the optical inputs are at least approximately point-shaped.

13. (Original) A sensor in accordance with claim 4, wherein the optical outputs and the optical inputs are at least approximately point-shaped.

14. (Currently Amended) A sensor in accordance with claim ~~2~~ 1, wherein the optical outputs and the optical inputs are each an end surface of an optical waveguide.

15. (Previously Presented) A sensor in accordance with claim 5, wherein the optical outputs and the optical inputs are each an end surface of an optical waveguide.

16. (Cancelled)

17. (Previously Presented) A sensor in accordance with claim 5, wherein the optical outputs and the optical inputs are each an opening of a diaphragm.

18. (Cancelled)

19. (Cancelled)

20. (Currently Amended) A sensor for optical displacement measurement in accordance with a confocal imaging principle, comprising:

first optical output means for emitting a first illumination beam;

second optical output means for emitting a second illumination beam;

means for merging the first illumination beam and the second illumination beam;

optic means for directing the two merged illumination beams onto a surface of a measurement object, and for creating a first real image of the first optical output means and a second real image of the second optical output means at different distances from the optic means, the different distances stemming from a first distance between the first optical output means and the

means for merging and a second distance between the second optical output means and the means for merging, the first distance is different than the second distance;

a first optical input means, coinciding in location with the first optical output means, for creating a first measuring beam on the surface, created by at least a partial reflection of the first illumination beam, the first illumination beam arriving in the first optical input means after passing through the optic means and after a transmission through the means for merging;

a second optical input means, coinciding in location with the second optical output means, for creating a second measuring beam on the surface, created by at least a partial reflection of the second illumination beam, the second illumination beam arriving in the second optical input after passing through the optic means and after a reflection at the means for merging;

first light detecting means for recording an intensity of the first measurement beam;

a second light detecting means for recording an intensity of the second measurement beam; ~~and~~

evaluation means for determining, from a comparison of the intensity of the first measurement beam and the intensity of the second measurement beam, a distance between the sensor and the surface,

at least one further first optical output means, positioned adjacent to the first optical output means, each for emitting a further first illumination beam which, after a transmission through the means for merging and after passing through the optic means, arrives at the surface;

at least one further second optical output means, equal in number to the at least one further first optical output means and positioned adjacent to the second optical output means, each for emitting a further second illumination beam which, after a reflection at the means for merging and after passing through the optic means, arrives at the surface;

at least one further first optical input means, equal in number to the at least one further first

optical output means, each of the at least one further first optical input means corresponds to one of the at least one further first optical output means and coincides in location with the corresponding one of the at least one further first optical output means, so that in each case a further first measuring beam is created on the surface by at least a partial reflection of a further first illumination beam arrives in the further first optical input means after passing through the optic means and after a transmission through the means for merging;

at least one further second optical input means, equal in number to the at least one further first optical output means, each of the at least one further second optical input means corresponds to one of the at least one further second optical output means and coincides in location with the corresponding one of the at least one further second optical output means so that a further second measuring beam is created on the surface by at least a partial reflection of a further second illumination beam, arrives in the further first optical input means after passing through the optic means and a after reflection at the means for merging;

at least one further first light detecting means, equal in number to the at least one further first optical output means, each for recording the intensity of a further first measurement beam; and

at least one further second light detecting means, equal in number to the at least one further first optical output means, each for recording the intensity of a further second measurement beam, wherein all further light detecting means are also coupled to the evaluation means so that, from a comparison of the intensities of the further measurement beams, the distance between the sensor and at least one scanning point on the surface, equal in number to the at least one further first optical output means, is adapted to be determined..

21. (Cancelled)

22. (Currently Amended) A sensor in accordance with claim ~~21~~ 20, wherein the optical output means are arranged in a line.

23. (Currently Amended) A sensor in accordance with claim ~~21~~ 20, wherein the optical output means are arranged in a matrix.

24. (Original) A sensor in accordance with claim 20, wherein the optical output means and the optical input means are at least approximately point-shaped.

25. (Previously Presented) A sensor in accordance with claim 20, wherein the optical output means and the optical input means are each an end surface of an optical waveguide.

26. (Previously Presented) A sensor in accordance with claim 20, wherein the optical output means and the optical input means are each an opening of a diaphragm.

27. (Original) A sensor in accordance with claim 20, wherein the light detecting means include monochrome light detectors.

28. (Previously Presented) A sensor in accordance with claim 20, wherein the first light detecting means are first cameras and the second light detecting means are second cameras.

29. (Currently Amended) A sensor in accordance with claim ~~21~~ 20, wherein

at least a majority of the first optical outputs are optically coupled to a first light source; and

at least a majority of the second optical outputs are optically coupled to a second light

source.

30. (Currently Amended) A method of optical displacement measurement using a sensor, in accordance with a confocal imaging principle, comprising:

merging a plurality of first illumination ~~beam~~ beams and a plurality of second illumination beams~~beam~~;

directing the ~~two~~ merged illumination beams onto a surface of a measurement object, and creating a plurality of first real images ~~image~~ and a plurality of second real images ~~image~~ at different distances, the different distances stemming from a first distance the plurality of first illumination beams travel ~~beam travels~~ prior to the merging and a second distance the plurality of second illumination beams travel ~~beam travels~~ prior to the merging, the first distance is different than the second distance;

creating ~~a~~ first measuring beams ~~beam~~ on the surface, created by at least a partial reflection of the plurality of first illumination beams~~beam~~; creating ~~a~~ second measuring beams ~~beam~~ on the surface, created by at least a partial reflection of the plurality of second illumination beams~~beam~~; and

determining, from a comparison of an intensity of the first measurement beams ~~beam~~ and an intensity of the second measurement beams~~beam~~, a distance between the sensor and the surface.

31. (Cancelled)